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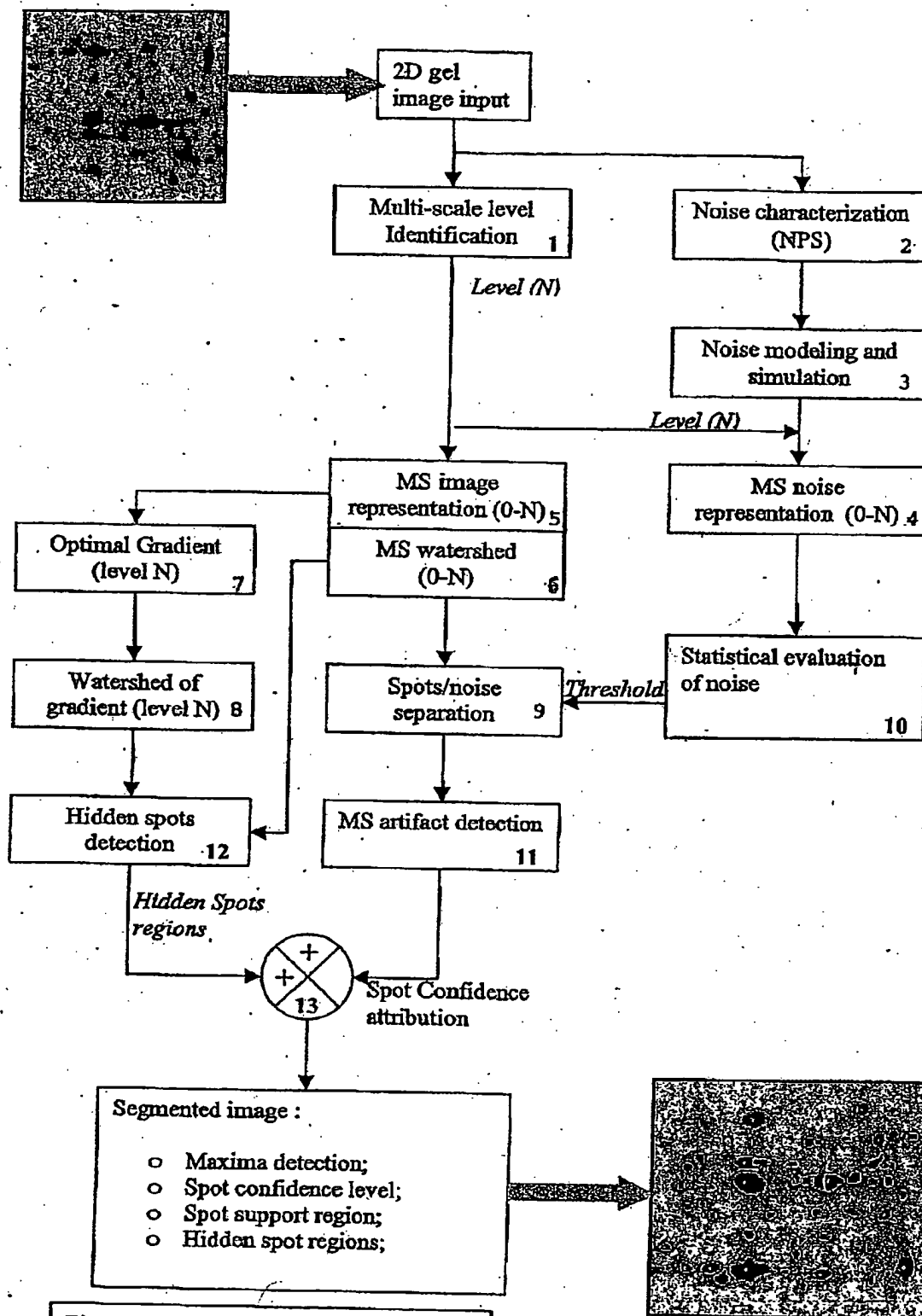


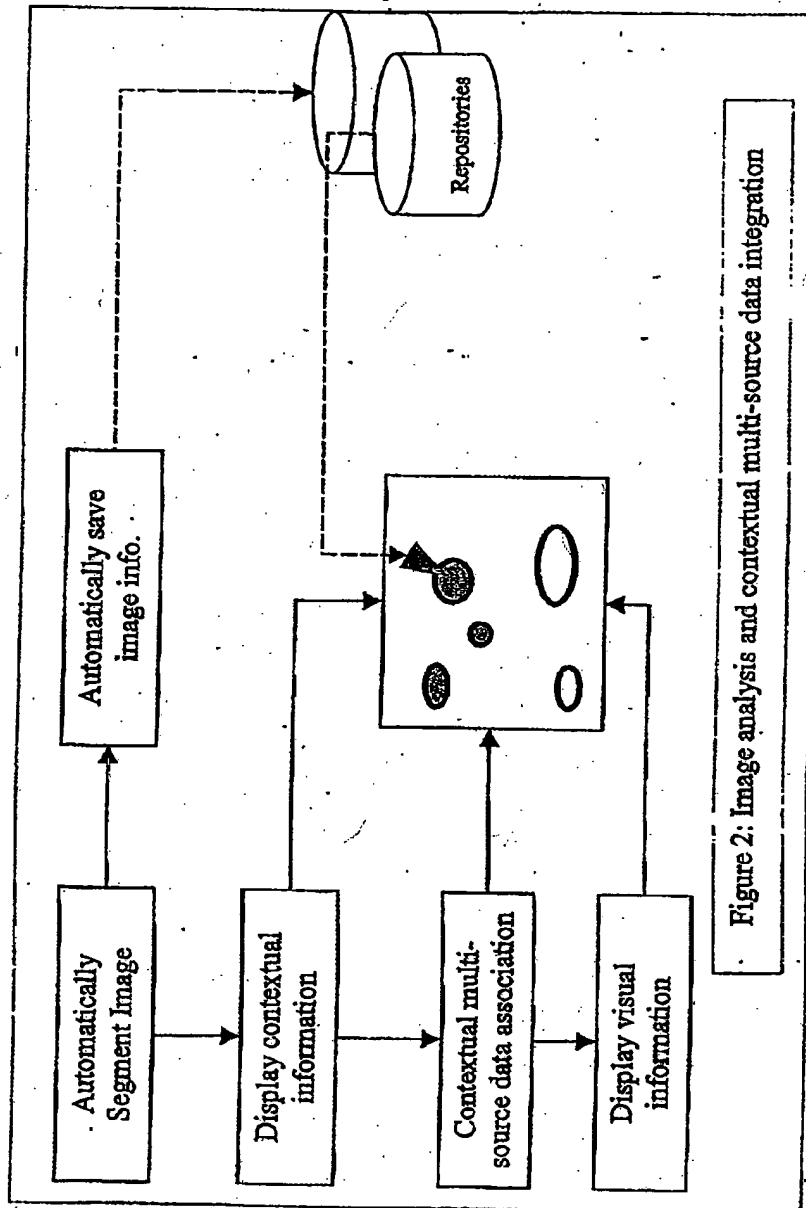
Figure 1: overall image analysis method

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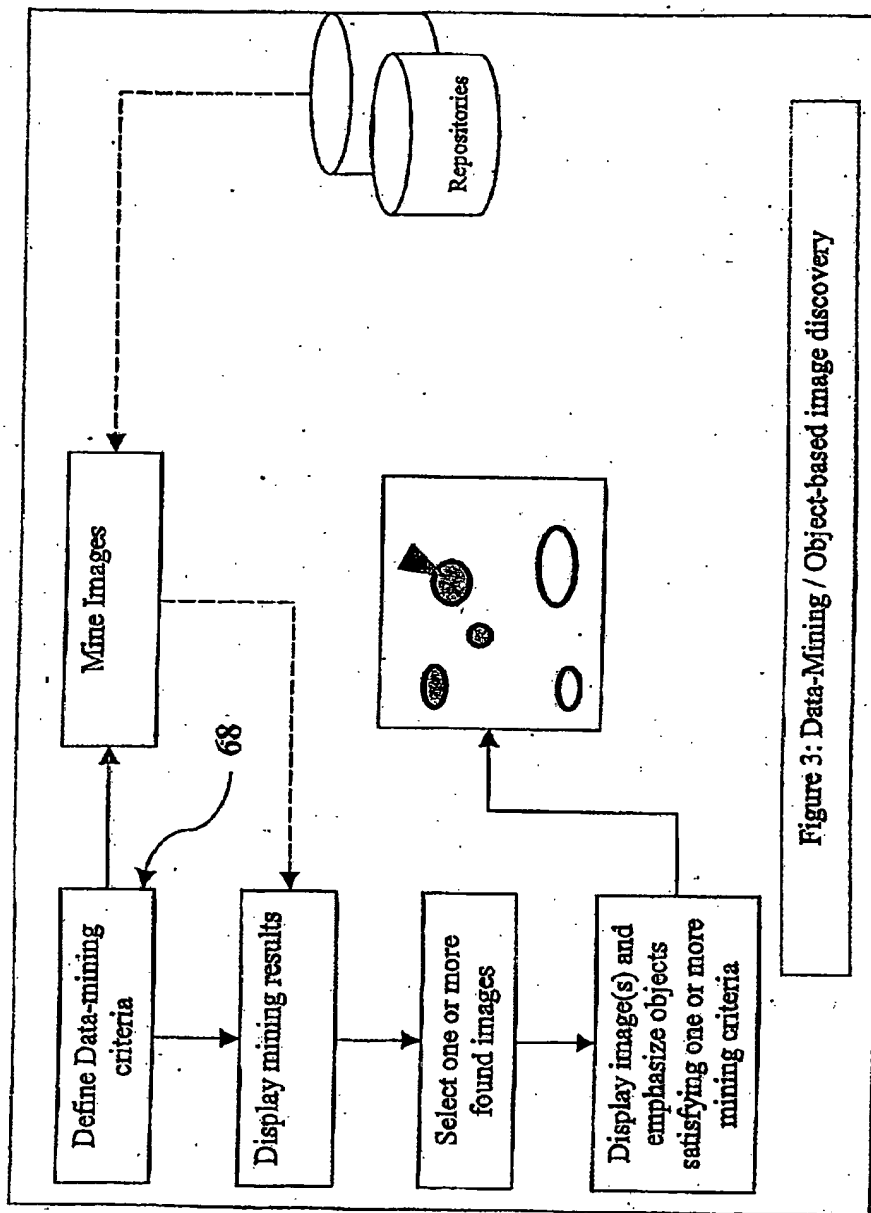
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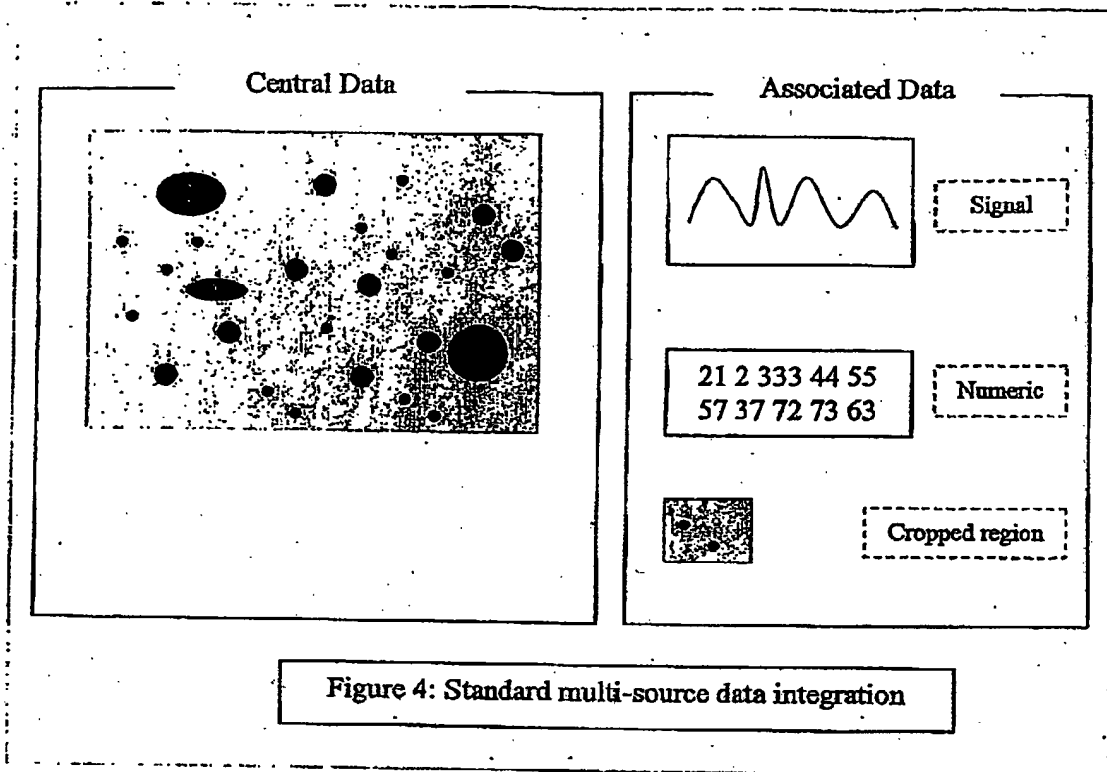
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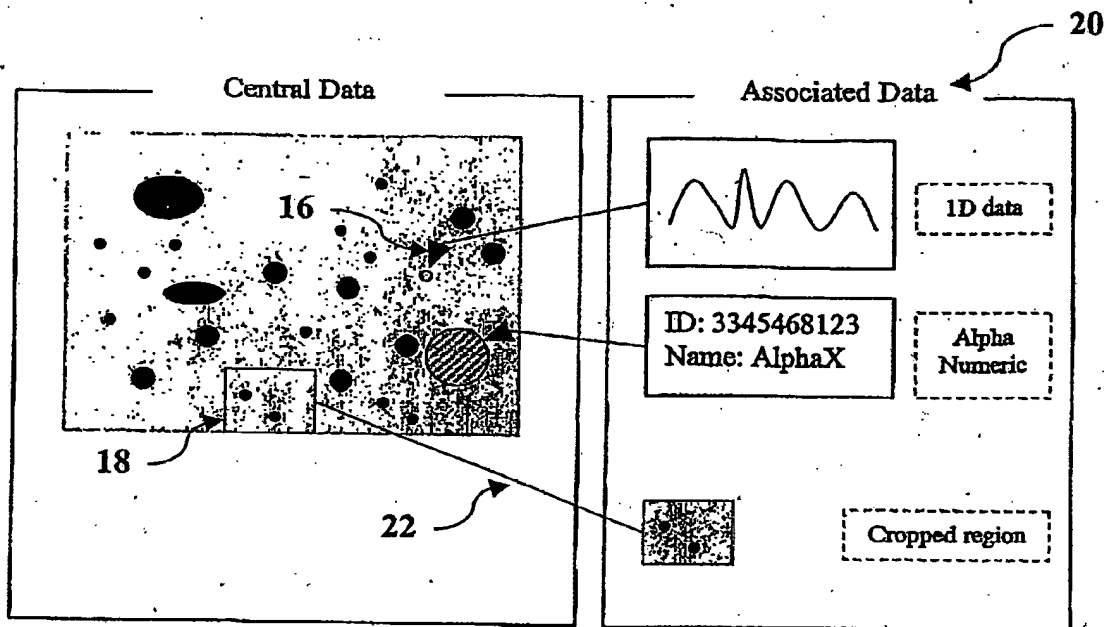
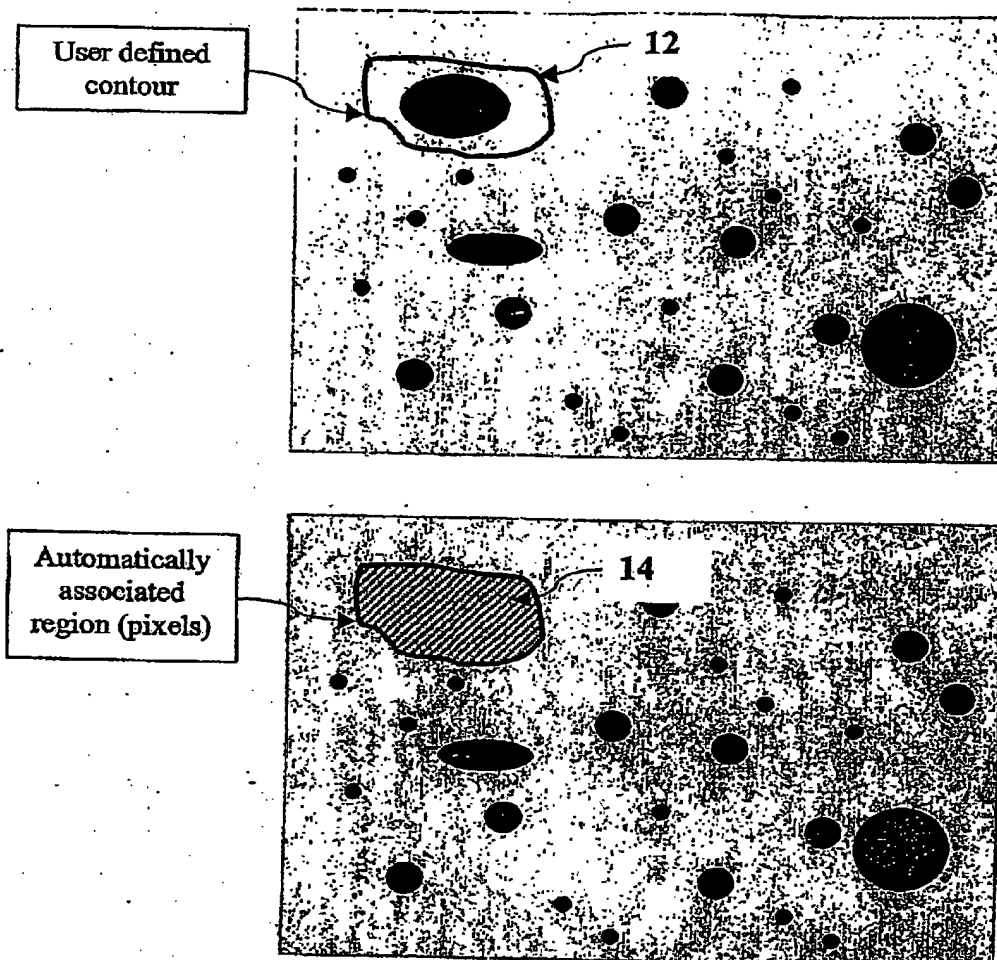


Figure 5: contextual multi-source data integration

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Figure 6: Interactive ROI selection

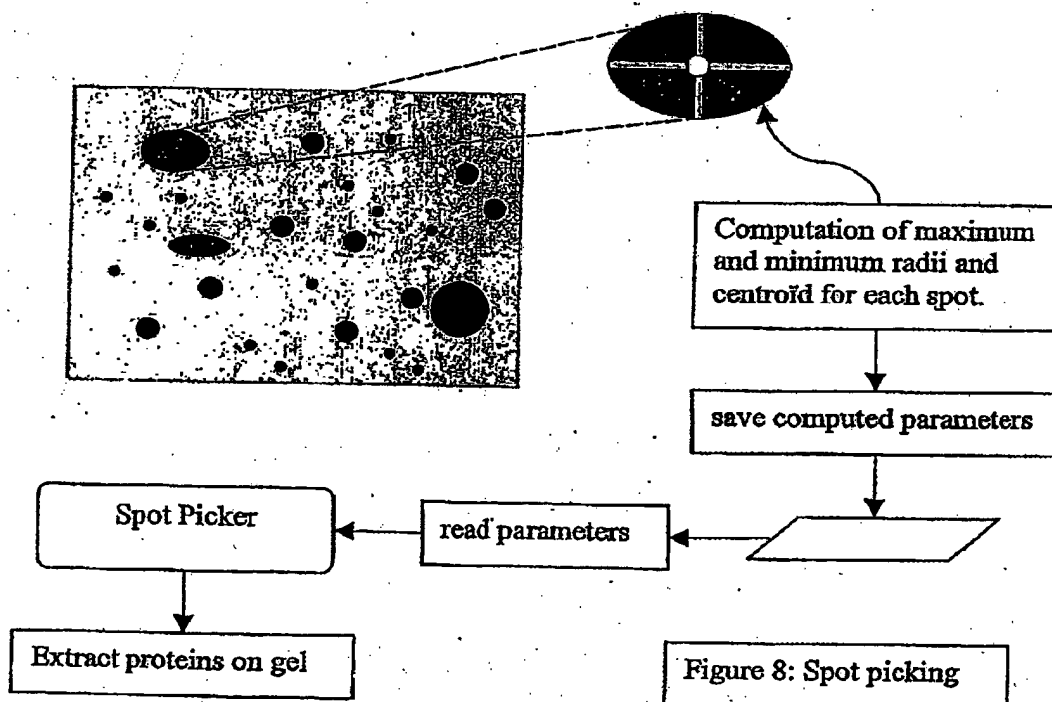
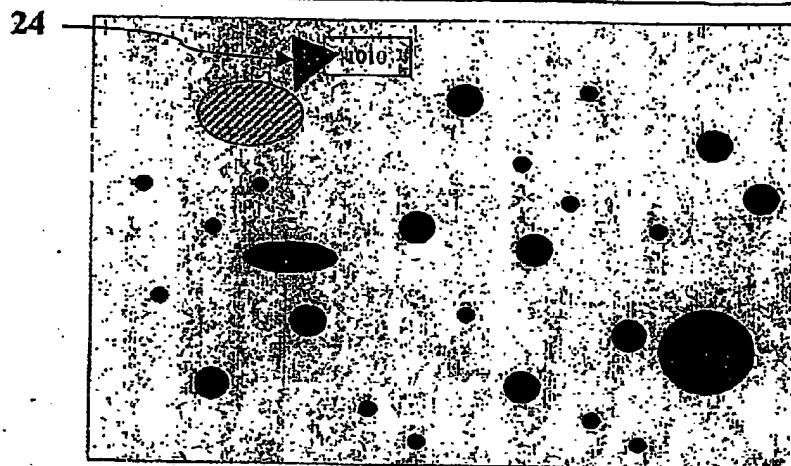


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Figure 7: Other visual indication of data association



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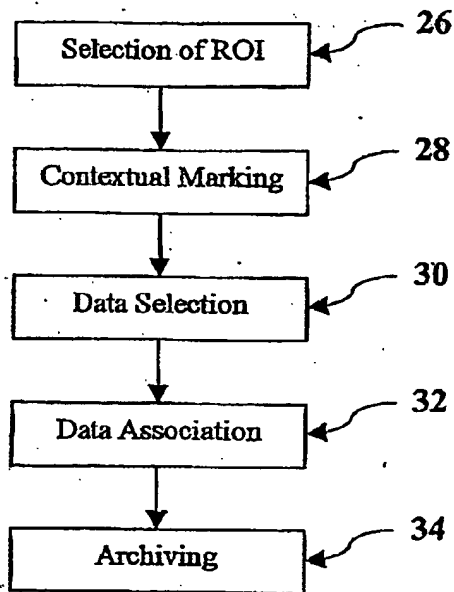


Figure 9: General flow of contextual data association



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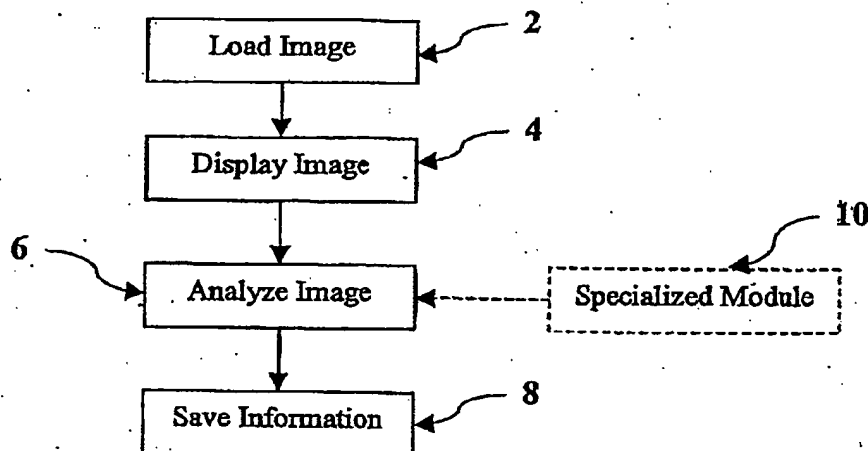
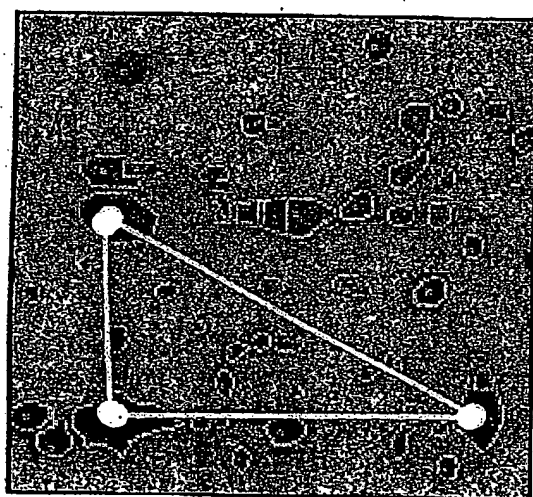


Figure 10: Basic image analysis Operational Flow



Discovered images		
Name	Location	Similarity
<u>Image 11</u>	//images	97%
<u>Image 93</u>	//images	94%
<u>Image 261</u>	//images	91%

Discovered images with possible pathology X (Signature X)

Click on image name to display image

Figure 11: Image data-mining and discovery results display in tabular form

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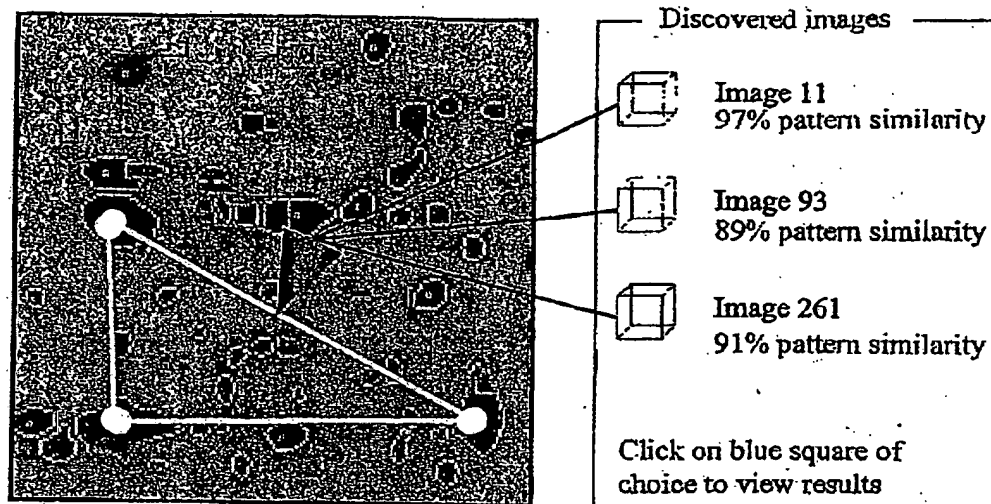


Figure 12: Image data-mining and discovery results display with visual associative links

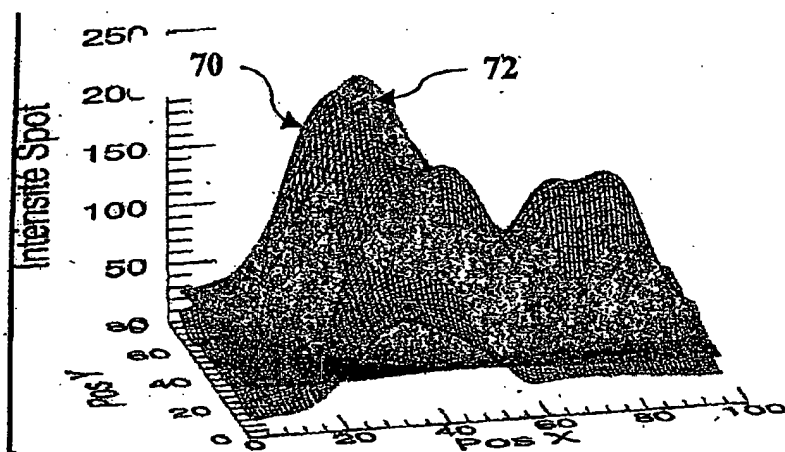


Figure 13: Simulated spots using diffusion functions

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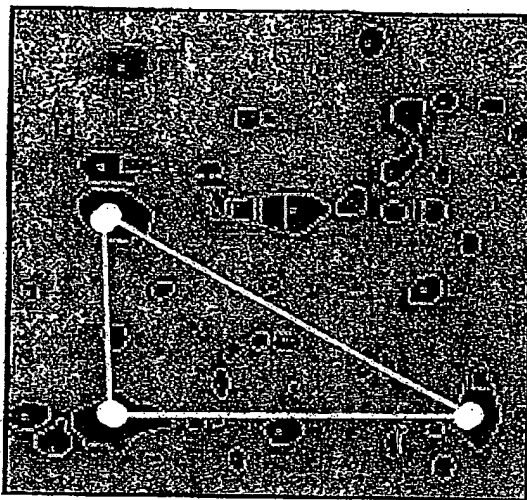


Figure 14: Example of multi-spot (protein) pattern

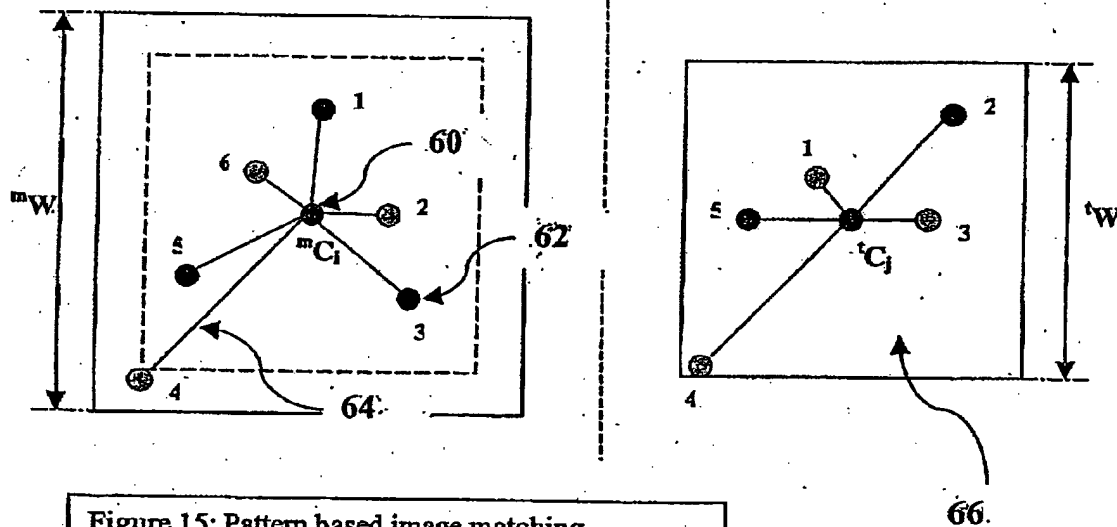


Figure 15: Pattern based image matching

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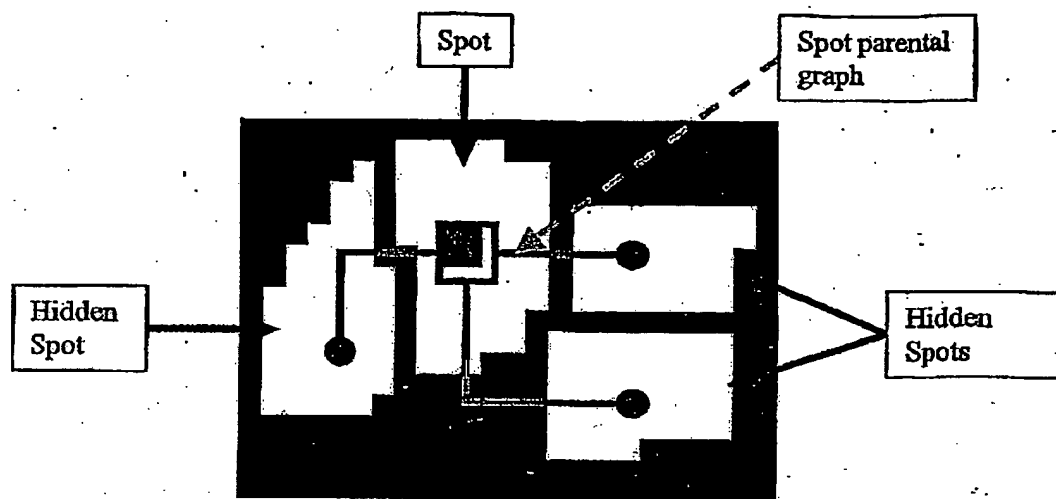


Figure 16: Hidden spot parental graph

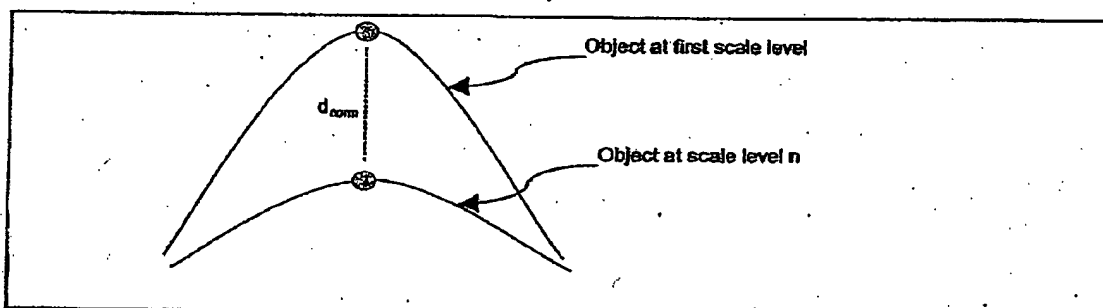


Figure 17 a: Two-scale energy amplitude

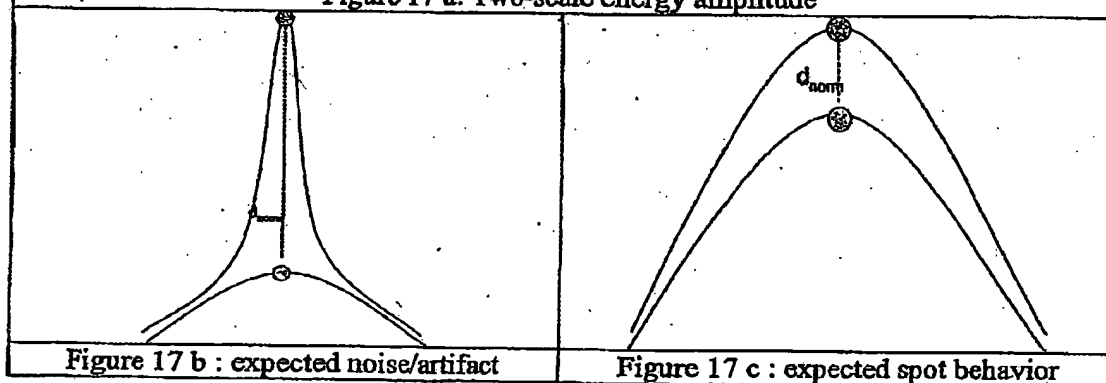


Figure 17 b : expected noise/artifact

Figure 17 c : expected spot behavior

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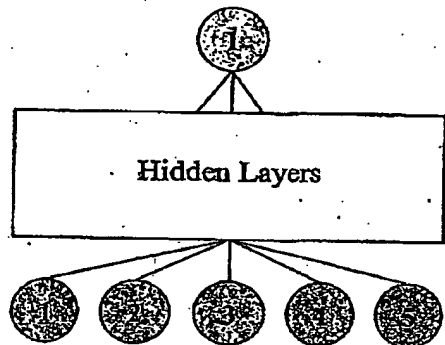
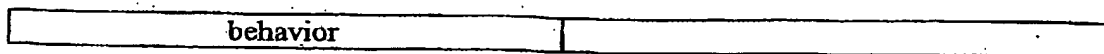


Figure 18: Simple Neural Network classifier

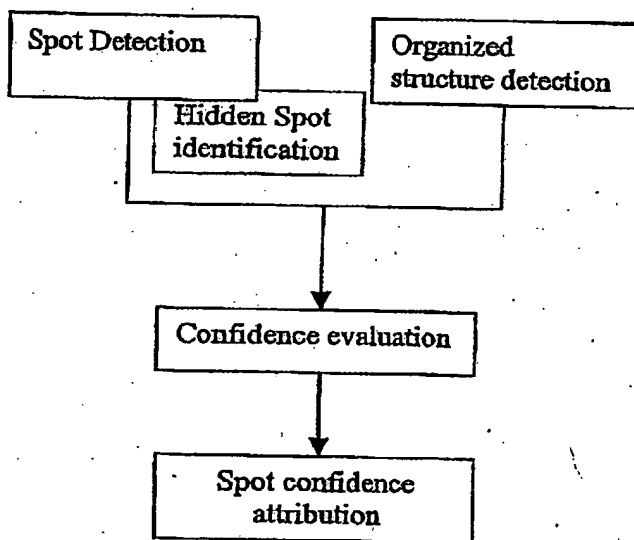
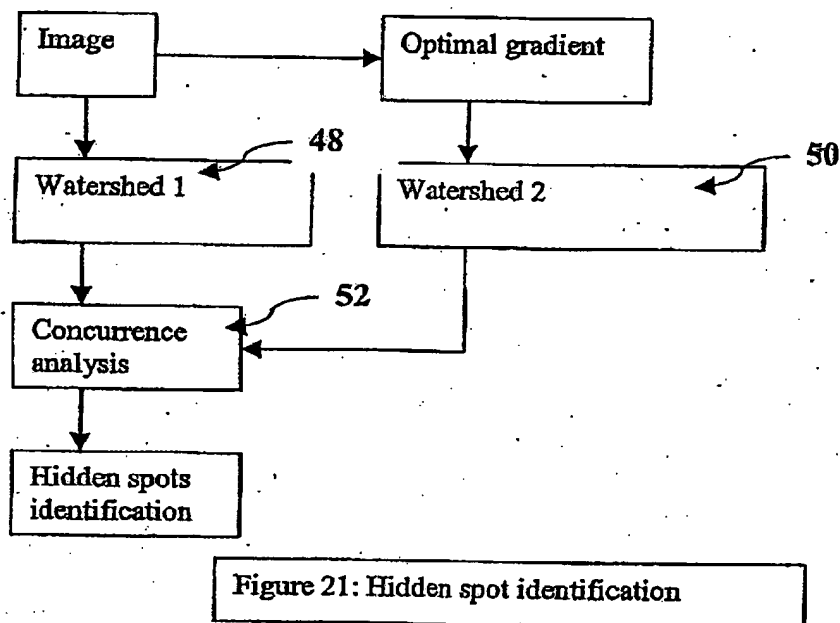
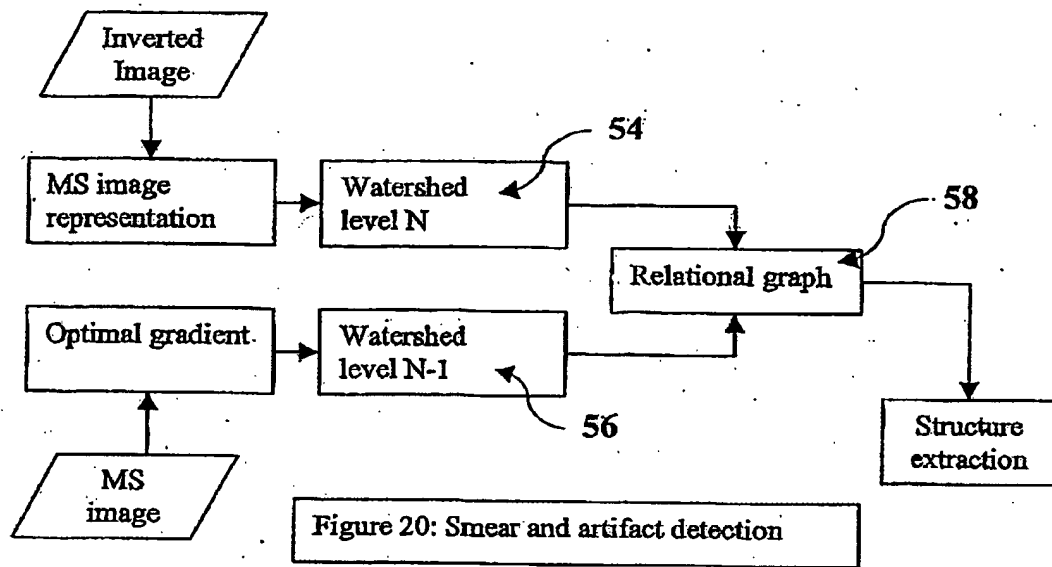


Figure 19: Spot confidence attribution process

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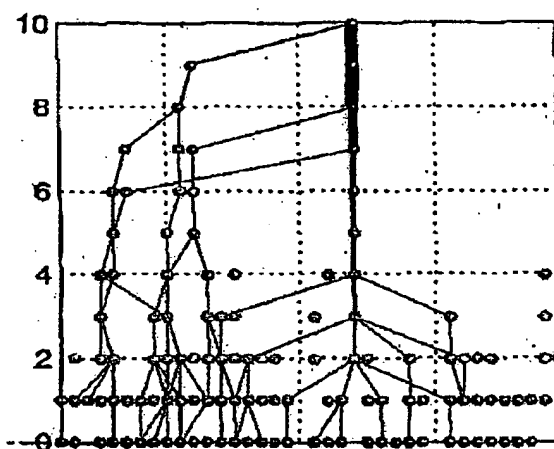
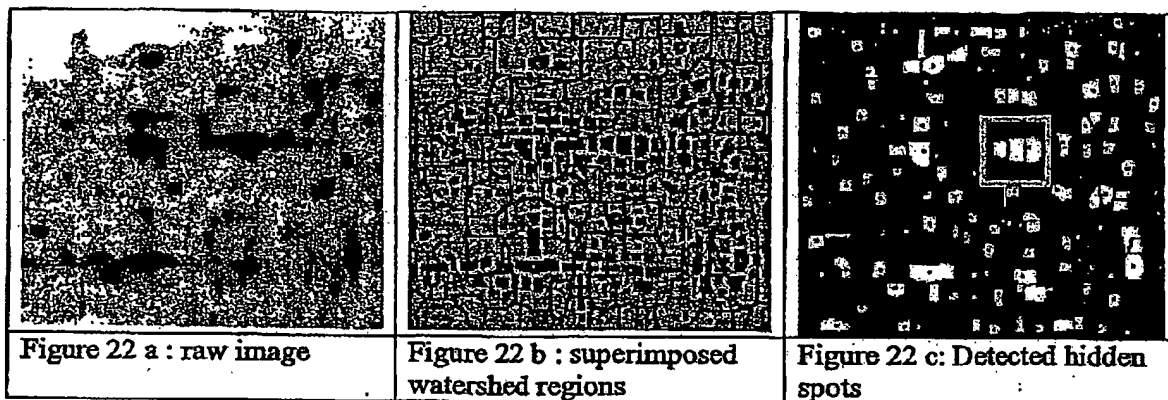


Figure 23: Profile view of Multiscale event tree

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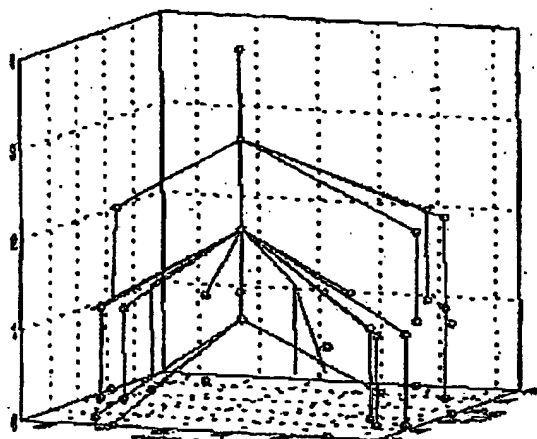


Figure 24: Typical 3D view of multiscale event tree of a spot

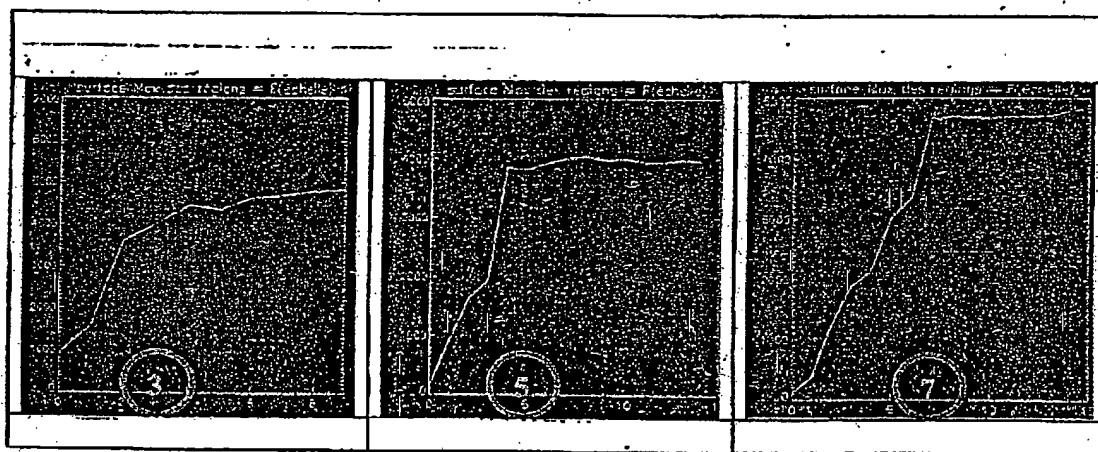
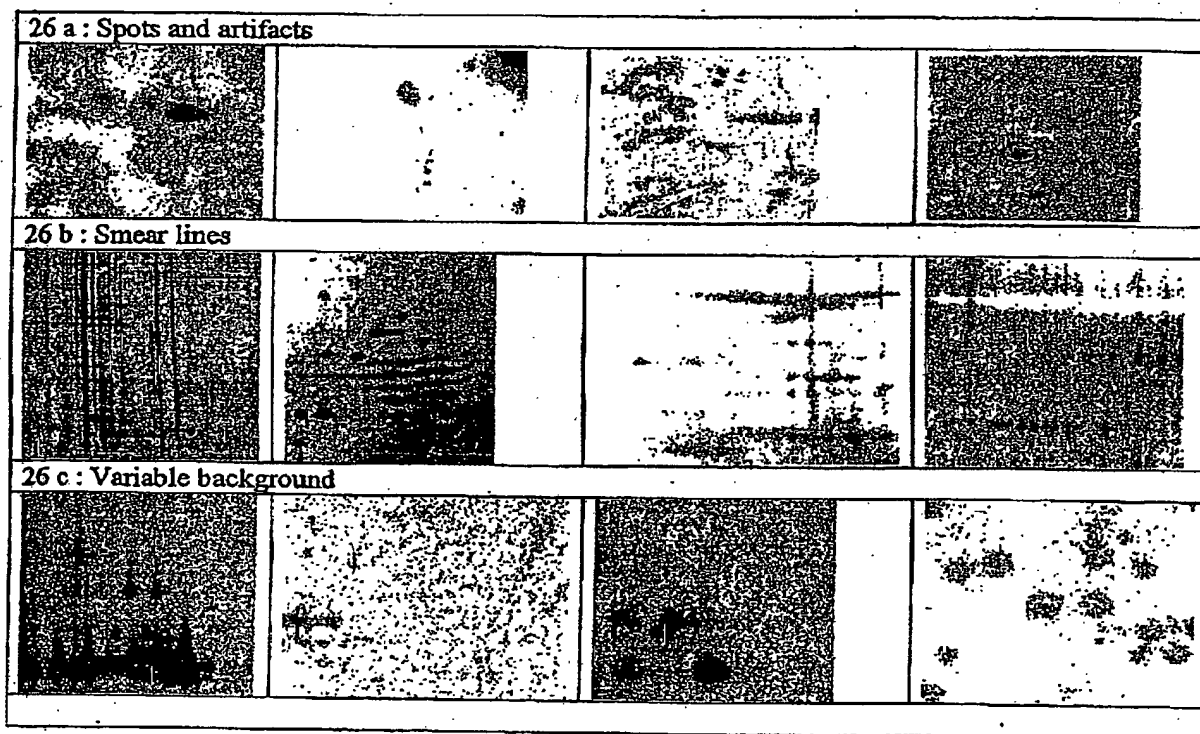
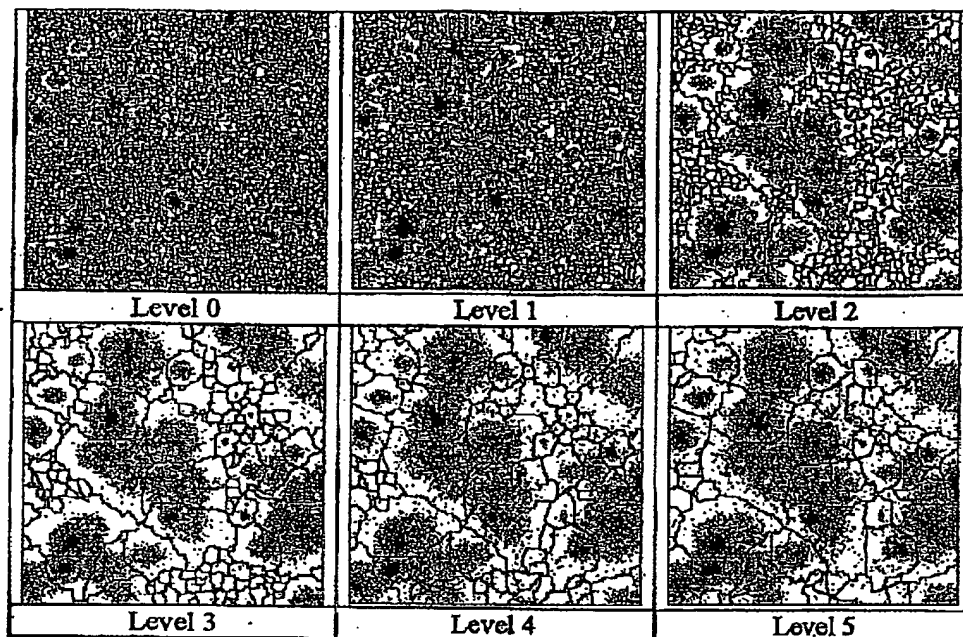


Figure 25 : Watershed regionalization of spot image at multiple scale levels (multiscale image regionalization).



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Figure 26 : Typical image variations

Eq. 1 : Poisson distribution

$$P(x) = \frac{\mu^x e^{-\mu}}{x!}$$

Eq. 2 : Gaussian modeled spot

$$G(\bar{x}, S) = \frac{1}{2\pi\sqrt{|S|}} \exp\left[-\frac{1}{2} \bar{x}^T S^{-1} \bar{x}\right], \text{ with } S = \begin{pmatrix} \sigma_x^2 & \rho\sigma_x\sigma_y \\ \rho\sigma_x\sigma_y & \sigma_y^2 \end{pmatrix}, \text{ where } \rho \text{ represents the x,y correlation coefficient.}$$

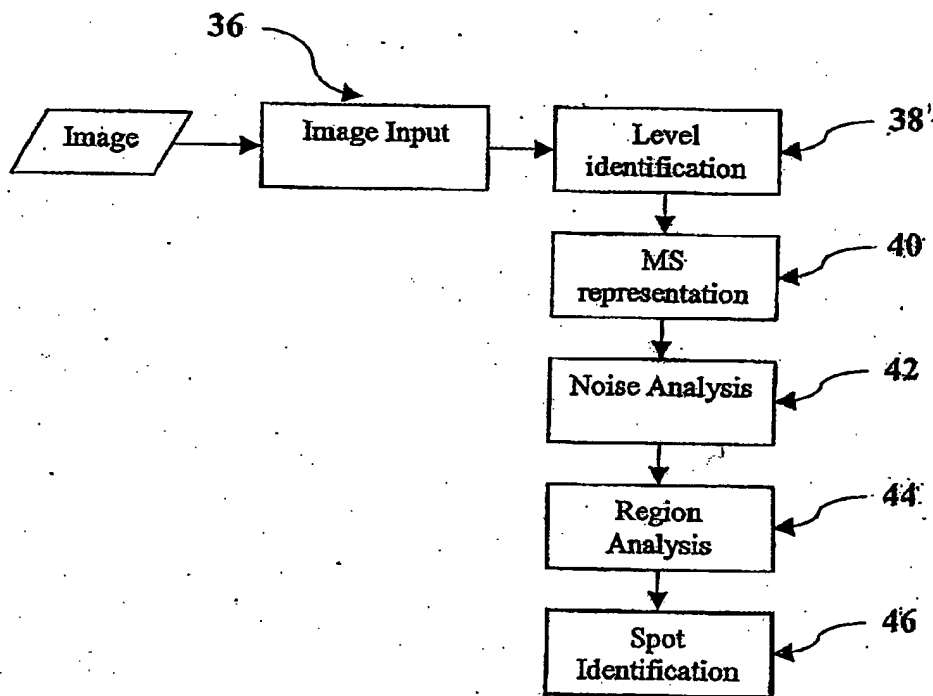


Figure 27: Overall spot identification process